SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

GHS PRODUCT IDENTIFIER

AQT 116

OTHER MEANS OF IDENTIFICATION

CAS:	111-30-8
EC:	203-856-5
RTECS:	MA2450000
ICSC:	0158
CHEMICAL FAMILY:	Aldehydes
SYNONYMS:	None
PROPER SHIPPING NAME:	CORROSIVE LIQUID, TOXIC, N.O.S.
MOLECULAR FORMULA:	C5H8O2
AVERAGE MASS:	100.117 g/mol
PRODUCT STOCK CODE/S:	AQT116A(25Kg), AQT116B(200Kg), AQT116C(1000Kg)

RECOMMENDED USE	RESTRICTIONS ON USE
AQT 116 is a combination broad spectrum biocide and algaecide for use in cooling water systems where bacteria and biofilm are expected to be present. It provides microorganism control and clean systems. **AQT 116** can be used in conjunction with most other water treatment products but should not be dosed into the same line as other products as this may lead to chemical reactions in the line.	Not for end user consumption. Not for food, drug, medical or household use.

SUPPLIER'S DETAILS

AQUATRADE WATER TREATMENT CHEMICALS (PTY) LTD

22 Grader Rd, Spartan
Gauteng, South Africa
Tel: +27 11 394 0752
info@aquatradesa.co.za
www.aquatradesa.co.za

PO Box 357
Isando, 1600

SDS Enquiries only

SDS ENQUIRIES ONLY		
NAME	**TEL**	**HOURS AVAILABLE**
R. van Rooyen	+27 76 590 9559	SAST 08:00 – 16:00 Mon. – Fri.

EMERGENCY PHONE NUMBER		
NAME	**TEL**	**HOURS AVAILABLE**
SPECIALIST		
H. van Niekerk	+27 82 410 5540	Mon. – Fri. 05:00 –20:00 GMT
Spilltech	+27 86 100 0366	24/7
OPERATOR		
SHEQ Coordinator	+27 76 590 9559 +27 87 654 3326	24/7 Mon. – Fri. 06:00 –18:00 GMT

SECTION 2 — HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

Acute Toxicity, Inhalation (Category 2)
Skin Corrosion/Irritation (Category 1B)
Serious Eye Damage/Irritation, (Category 1)
Respiratory Sensitisation (Category 1)
Skin Sensitisation (Category 1)
Specific Target Organ Toxicity - Single Exposure - Respiratory system, (Category 3)
Acute Aquatic Toxicity (Category 1)
Chronic Aquatic Toxicity (Category 2)

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS LABEL ELEMENTS

GHS SIGNAL WORD

Danger

GHS HAZARD CODES

Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Causes serious eye damage.
Toxic if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

GHS PRECAUTIONARY CODES

Do not breathe spray.
Wash exposed areas thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
[In case of inadequate ventilation] wear respiratory protection.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN: Wash with plenty of water and soap.
IF ON SKIN (or hair): Take off immediately all contaminated clothing.
Rinse skin with water [or shower].
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
Specific treatment (see IF SWALLOWED, IF ON SKIN, IF INHALED, IF IN EYES on this label).
If skin irritation or rash occurs: Get medical advice/attention.
If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
Take off contaminated clothing and wash it before reuse.
Wash contaminated clothing before reuse.
Collect spillage.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents and container in accordance with local, regional, national, international regulations to licenced hazardous waste manager.

PICTOGRAMS

OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION

This substance/mixture contains no components considered to be either persistent, bio accumulative and toxic (PBT), or very persistent and very bio accumulative (vPvB) at levels of 0.1% or higher.

SECTION 3 — COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS	EC	MIN %	MAX %	HAZARD NOTES
Glutaraldehyde 50%	111-30-8	203-856-5		31	H301: Toxic if swallowed. H330: Fatal if inhaled. H314: Causes severe skin burns and eye damage. H317: May cause an allergic skin reaction. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335: May cause respiratory irritation. H400: Very toxic to aquatic life. H411: Toxic to aquatic life with long lasting effects.

***Note**: CBI – Information available, on request, to the regulatory authority and emergency responders.*

SECTION 4 — FIRST-AID MEASURES

DESCRIPTION OF NECESSARY FIRST AID MEASURES

IF INHALED	Remove exposed person from source of exposure to fresh air. If not breathing, clear airway and start cardiopulmonary resuscitation (CPR). Get immediate medical attention. Immediately inhale corticosteroid dose aerosol.
IF IN CONTACT WITH EYES	Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get immediate medical attention.
IF IN CONTACT WITH SKIN	Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist. Remove contaminated clothing and shoes. Wash contaminated clothing before reuse.
IF INGESTED	Do not induce vomiting unless directed by medical personnel. Drink 1 to 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE and DELAYED

IF INHALED	No test data available.
IF IN CONTACT WITH EYES	> 5% glutaraldehyde solutions caused severe conjunctivitis and corneal injury /in rabbit/. No effect concentration for corneal injury = 5%; no effect concentration for conjunctivitis = 0.1%. Installation of 0.5 mL of diluted Ucarcide glutaraldehyde solutions /into eye of rabbit/; corneal effects after 24 hr: 2.5% severe keratitis; 1.25% severe keratitis; 1.0% moderate keratitis; 0.5% mild superficial corneal injury. The threshold for induction of inflammatory effects is between 0.25 - 0.5%.
IF IN CONTACT WITH SKIN	Effects produced on rabbit skin by occlusive contact with 0.5 mL of various concentrations of glutaraldehyde solutions: 1%: no effect; 2%: minor erythema of 1-7 days duration; 5%: minor to moderate erythema persisting 2-14 days, minor oedema persisting for 7 days; 10%: moderate erythema of 14-21 days duration, mild to moderate oedema persisting 7-14 days; 25% minor to moderate erythema and oedema persisting 7-14 days, punctate foci of necrosis; 45% moderate to severe erythema persisting up to 3 weeks, mild to severe oedema persisting up to 14 days, foci of necrosis; 50%: persistent moderate erythema, marked oedema, multiple foci of necrosis. Occluded contact /in rabbit/ with 50% glutaraldehyde solutions in water. Two products tested: Ucarcide 250 and BASF 50% Glutaraldehyde. Severity of

	irritation was dependent on the duration of contact. Application of 50% glutaraldehyde for 60 min caused severe irritation and necrosis; 3 min produced transient minor irritation and some discoloration of the skin.
IF INGESTED	No test data available.

INDICATION OF IMMEDIATE MEDICAL ATTENTION & SPECIAL TREATMENT NEEDED, IF NECESSARY

Treat according to symptoms (decontamination, vital functions), no known specific antidote. Pulmonary oedema prophylaxis. Medical monitoring for at least 24 hours.

SECTION 5 — FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Dry chemical, CO2, alcohol-resistant foam, or water spray. **Procedure**: Use water spray to cool containers exposed to fire. Minimize exposure. Do not breathe fumes. Contain run-off. A respirator or NIOSH-approved positive pressure suit should be worn if conditions warrant.
EXTINGUISHING MEDIA NOT SUITABLE	None known.
SPECIFIC HAZARDS ARISING FROM THE CHEMICAL	Nitrogen Oxides, Carbon Oxides can be released in case of fire.
SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS incl. PPE	**Personal protective equipment**: Fire fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus. Do not breathe corrosive fumes from burning material. Keep upwind.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PPE & EMERGENCY PROCEDURES	Avoid contact with skin and eyes. Do not breathe in spray or fumes. For personal protection see Section 8. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.
ENVIRONMENTAL PRECAUTIONS	DO NOT discharge into drains/surface waters/groundwater.
METHODS & MATERIALS FOR CONTAIMENT & CLEANING UP	**Small spills**: Pick up with suitable absorbent material (e.g., sand, sawdust, general-purpose binder, kieselguhr). Dispose of absorbed material in accordance with regulations. **Large spills**: Stop / isolate source of leaks and prevent entry to waterways, sewers and buildings where possible. Seal off area and contain material by diking with soil or other inert material. Recover as much as possible and then apply an inert material such as sawdust to absorb the remainder. Collect in suitable containers and then wash and scrub away the residue. **Disposal**: Dispose of product and containers in accordance with SA National and / or regional Regulations refer National Environmental Management Waste Act - NEMWA, it's Regulations and local by-laws. This informs permitted Waste Facilities and Service providers see the South African Waste Information Centre (environment.gov.za)

SECTION 7 — HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING	Do not get in eyes, on skin or on clothing. Do not breathe vapours or mists. Keep container closed. Use only with adequate ventilation. Use good hygiene practices.

Wash hands before eating, drinking, or smoking. Remove contaminated clothing and clean before re-use.

Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. Prevent electrostatic charge - sources of ignition should be kept well clear – fire extinguishers should be kept handy.

CONDITIONS FOR SAFE STORAGE

Store in cool place out of direct sun in HEDP containers and avoid sources of potential contamination. Avoid temperature extremes above 40 °C and do not allow product to freeze.

Segregation and or Separation requirements:

Compatible	Dangerous goods of the same Class should be compatible; consult SDS or suppliers about requirements for individual substances.	Class 8A
Keep Apart	Dangerous goods of these Classes should be kept apart by at least 3m. Consult the SDS or supplier.	Class 2.1, 2.2, 2.3, 3, 4.2, 5.1 and 5.2.
Segregate From	These combinations of dangerous goods should segregate by at least 5 m and kept in separate compounds or building compartments.	Class 1 and 7
Segregation may be Necessary	Segregation of these Classes may be necessary. Consult the SDS or supplier.	Class 4.1, 4.3, and 6.1
Isolate	This requirement applies to organic peroxides, for which dedicated stores or storage cabinets are recommended. Adequate separation from other buildings and boundaries is required.	N/A
Dangerous goods of the same class could be incompatible or react dangerously; Consult SDS or suppliers about requirements for individual substances.		Class 8B

***NOTES**:*

1. *In all cases, the SDS or supplier of the goods should **ALWAYS** be consulted.*
2. *Non-dangerous goods may be kept in segregation spaces, if they will not react dangerously with any of the dangerous goods being kept.*
3. *Non-dangerous goods that are combustible (excluding combustible liquids) may be kept in such spaces, provided that.*
   a) *hazard assessment, including an assessment of the additional fire load, has been carried out; and*
   b) *any necessary additional fire protection is provided.*

The volume of any non-dangerous goods kept in the segregation spaces needs to be considered when calculating the volume of the spillage containment for the store.

UN Packaging Codes			
Stock Code	**Pack Size**	**Make & Category**	**UN Code**
AQT116A	25 Kg	Jerrican Plastics Non-Removable Head	UN3H1/Y
AQT116B	200 Kg	Drum Plastics Non-Removable Head	UN1H1/Y
AQT116C	1000 Kg	Composite IBC Plastic Receptacle Steel Cage	UN31HA1/Y

	Suitable storage materials: PVC – Poly Vinyl Chloride, HDPE – High Density Polyethylene, PP – Polypropylene, SS – Stainless Steel, PTFE - Polytetrafluoroethylene, and most rubbers. **Unsuitable storage materials:** Mild steel, iron, copper, aluminium and alloys. **Shelf Life**: 12 Months
INCOMPATIBILTIES	**Conditions to avoid: H**eat, Direct Sunlight. **Substances to avoid:** None known.
SANS 10263-0 WAREHOUSING	**8.4.3.2** Where flammable or **corrosive** substances are stored, the floor shall slope away from the storage area (primary collection area) to a secondary catch basin or sump of capacity at least 10 % of the total available storage volume of the fire section concerned. The secondary catch basin shall be within the fire section and shall be such that it can be well ventilated. Care shall be taken in the design of such areas to prevent contamination of the soil or ground water. **9.7.2** Every type of storage area inside a warehouse shall be clearly demarcated, for example separate storage areas for poisons, flammables and **corrosives** shall display the relevant hazard class diamond (see table 1). The dimensions of the hazard class diamonds shall be at least 250 mm x 250 mm. **12.8.5** Storage of flammable liquids of class 3, toxic substances of division 6.1 and **corrosives** of class 8. Nitro-methane class 3, UN No. 1261, shall be separated from substances of class 6.1, and cyanides of division 6.1 shall be separated from acids of class 8. Concentrated acids and bases shall be segregated by at least 1 m. Packaged flammable liquids of class 3, toxic substances of division 6.1 and corrosives of class 8 that are of category 3 can be stored in the same area, provided that. • they are kept above floor level, and • liquid dangerous goods of one class are not stored above dangerous goods of another class. **12.8.8.3** Toxic and infectious substances (see class 6 in SANS 10228) can contaminate firefighting water in the event of a fire, therefore: a) Toxic and infectious substances shall be separated from other flammable products and aerosols. b) Toxic and infectious substances shall be segregated from oxidizing substances, organic peroxides, and **corrosives**. c) Flammable toxic and infectious substances shall be separated from non-flammable toxic and infectious substances (see 12.8.8.1). **12.8.8.4** Corrosives (see class 8 in SANS 10228) that leak or spill from their packaging can cause serious damage to other packages, with potentially hazardous consequences. **Corrosives** shall be segregated from toxic substances, infectious substances, aerosols, flammables, oxidizing substances, and organic peroxides. The provisions of above apply to the storage of the following quantities of dangerous goods.

CORROSIVES (ACIDS AND BASES CLASS 8	
Category 1	> 50 Kg
Category 2	> 200 Kg

Category 3	> 1 000 Kg
TOXIC AND INFECTIOUS SUBSTANCES	
CLASS 6.1	
Category 1	> 5 Kg
Category 2	> 50 Kg
Category 3	> 500 Kg
CLASS 6.2	
All quantities	

SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

CONTROL PARAMETERS

OCCUPATIONAL EXPOSURE LIMITS (OEL)	Contains no substances with maximum occupational exposure limit values. **SOUTH AFRICA: HCA REG, 2021 (Recommended OEL)** **Glutaraldehyde: 111-30-8: OCH(CH2)3CHO** OEL-STEL/C 0,1 ppm; NOTATIONS: DSEN, RSEN **INTERNATIONAL** REL (USA) Ceiling limit: 0.8 mg/m³, 0.2 ppm C TLV (USA) Ceiling limit: 0.2 mg/m³, 0.05 ppm; DSEN, RSEN; activated or inactivated. WEL (Great Britain) Short-term value: 0.2 mg/m³, 0.05 ppm Long-term value: 0.2 mg/m³, 0.05 ppm. DNELs: 0.0106 mg/m³, worker, inhalation, long-term, localised effects. ACGIH: TLV Ceiling: 0.05 ppm OSHA: PEL: Vacated Ceiling: 0.2 ppm 0.8 mg/m^3 NIOSH: IDL: Ceiling: 0.2 ppm 0.8 mg/m^3 Mexico: OEL (TWA) Ceiling: 0.2 ppm 0.7 mg/m^3
ADDITIONAL EXPOSURE LIMITS UNDER THE CONDITIONS OF USE	Contains no substances with biological exposure indices.
DNEL/DMEL AND PNEC-VALUES	No additional data.

APPROPIATE ENGINEERING CONTROLS

Use local exhaust ventilation with a minimum capture velocity of 0.75 m/sec. (150 ft/min.) at the point of dust or mist evolution. Refer to SANS 10400-O and/or the current edition of "Industrial Ventilation: A Manual of Recommended Practice" published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems. Maintain air concentrations below occupational exposure standards. Ensure that eyewash stations and safety showers are close to the workstation location.

General safety and hygiene measures: DO NOT breathe vapour/spray. Avoid contact with the skin, eyes, and clothing. Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment.

INDIVIDUAL PROTECTION MEASURES

EYE PROTECTION		Wear tight fitting safety goggles or safety glasses with side shields. Use equipment for eye protection tested and approved under appropriate government standards such as SANS 50166:2018. Contact lenses should not be worn as they may contribute to severe eye injury..

<table>
<tr><td>FACE PROTECTION</td><td>  </td><td>If the face is at risk a protective shield must also be worn tested and approved under appropriate government standards such as SANS 1400:2010.

WARNING – A face shield shall not be worn during the application of dangerous substances that emit toxic vapours or low boiling-point organic solutions.</td></tr>
<tr><td>HAND PROTECTION</td><td>  </td><td>Use protective gloves. Check the tightness before wear. Gloves should be well cleaned before being removed, then stored in a well-ventilated location. Pay attention to skin care. Skin protection cremes do not protect sufficiently against the substance.

Suggested material:
Rating: 1 – Not Recommended, 2 – Good, 3 – Fair, 4 – Excellent
<table>
<tr><th>Material Type</th><th>Rating</th><th>Expected Breakthrough</th></tr>
<tr><td>Butyl</td><td>4</td><td>> 8 Hrs</td></tr>
<tr><td>Neoprene</td><td>4</td><td>> 8 Hrs</td></tr>
<tr><td>PVC (Polyvinylchloride)</td><td>4</td><td>> 8 Hrs</td></tr>
<tr><td>Viton</td><td>4</td><td>> 8 Hrs</td></tr>
<tr><td>Nitrile (Acrylonitrile Butadiene Rubber)</td><td>3</td><td>> 4 Hr</td></tr>
<tr><td>Natural Rubber (Latex)</td><td>1</td><td>< 1 Hr</td></tr>
<tr><td>Synthetic Fibre/Fibreglass</td><td>1</td><td>< 1 Hr</td></tr>
</table>
If used in solution, or mixed with other substances, and under conditions which differ from SANS 416:2021 or SANS 1228:2012, contact the supplier of the CE approved gloves.</td></tr>
<tr><td>BODY PROTECTION</td><td>  </td><td>Complete suit protecting against chemicals tested and approved under appropriate government standards such as SANS 54325:2019. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.</td></tr>
<tr><td>RESPIRATORY PROTECTION</td><td>  </td><td>Where risk assessment shows air-purifying respirators are appropriate use an elastomeric half-face particle respirator with type ABEK1P3, SANS 50141:2003 combination respirator cartridges as a backup to engineering controls. Use respirators and components tested and approved under appropriate government standards such as SANS 50136:1998, SANS 50137:2011, SANS 50140:1998.

Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacture.</td></tr>
</table>

***NOTE**: The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors. Recommendations above is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.*

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE (PHYSICAL STATE, COLOUR ETC):	Clear Colorless Liquid
ODOUR:	No recognizable odour.
ODOUR THRESHOLD:	No test data available
pH:	3.0 – 6.0 (1% Aq. Sol.)
MELTING/FREEZING POINT:	No test data available
INITIAL BOILING POINT AND BOILING RANGE:	No test data available
FLASH POINT:	Not applicable. Does not sustain combustion.
EVAPORATION RATE:	No test data available
FLAMMABILITY (SOLID, GAS):	Not flammable
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:	Not explosive

VAPOUR PRESSURE:	No test data available
VAPOUR DENSITY:	No test data available
RELATIVE DENSITY @ 25 °C:	1.02 – 1.05
SOLUBILITY(IES):	Soluble in water
PARTITION COEFFICIENT: N-OCTANOL/WATER:	No test data available
AUTO-IGNITION TEMPERATURE:	No test data available
DECOMPOSITION TEMPERATURE:	No test data available
VISCOSITY:	No test data available
OXIDIZING PROPERTIES:	Non-Oxidizing

NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10 — STABILITY AND REACTIVITY

REACTIVITY	No hazardous reactions if stored and handled as prescribed/indicated. **Corrosion to metals**: Corrosive effect on metals.
CHEMICAL STABILTY	The product is stable if stored and handled as prescribed/indicated. This product is stable at ambient temperatures and atmospheric pressures. It is not self-reactive and is not sensitive to physical impact.
POSSIBILTY of HAZARDOUS REACTIONS	Reacts with amines. Exothermic reaction.
CONDITIONS TO AVOID	Avoid all sources of ignition: heat, sparks, open flame. See SDS section 7 - Handling and storage
INCOMPATIBLE MATERIALS	Amines. Oxidizing agents. Strong acids and bases.
HAZARDOUS DECOMPOSITION PRODUCTS	In case of fire hazardous decomposition products may be produced such as: Carbon oxides.

SECTION 11 — TOXICOLOGICAL INFORMATION

TOXICOLOGICAL (HEALTH) EFFECTS

ACUTE TOXICITY	Toxic if inhaled.
SKIN CORROSION/IRRITATION	Causes severe skin burns and eye damage.
SERIOUS EYE DAMAGE/EYE IRRITATION	Causes serious eye damage.
RESPIRATORY OR SKIN SENSITIZATION	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
GERM CELL MUTAGENICITY	Based on available data, the classification criteria are not met.
CARCINOGENICITY	Based on available data, the classification criteria are not met.
REPRODUCTIVE TOXICITY	Based on available data, the classification criteria are not met
SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE	Based on available data, the classification criteria are not met.
SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE	Based on available data, the classification criteria are not met.
ASPIRATION HAZARD	Based on available data, the classification criteria are not met.

LIKELY SOURCES OF EXPOSURE

INHALATION	EYES	SKIN	INGESTION
Unlikely	Likely	Likely	Rare
Unpacking or mixing of product.	Unpacking or mixing of product.	Unpacking or mixing of product.	Unpacking or mixing of product.

SYMPTOMS RELATED TO PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS

Oral Toxicity

Clinical signs: Sluggishness, lacrimation, piloerection, diarrhea, trace amount of blood in the urine of two rats, a redcrust on the perinasal fur and a brown stain on the perineal fur (of 1 rat). Surviving rats recovered within 4 to 5 days.

Body weight: Surviving animals showed body weight gain over the 14-day post-dose observation period.

Gross pathology: Necropsy of the rats that died revealed red lunges, red to dark maroon stomachs (some hemorrhaged, 1 filled with red liquid), discolored intestines (yellow, red, brown, or black), dark red kidneys (in 2 rats) and a small amount of blood in the urine of 1 rat. Gross pathologic evaluation of survivors revealed no remarkable gross lesions.

Inhalation Toxicity

Clinical signs: During the exposure period vigorous attempts to escape, wiping of the snout, lid closure, and aqueousor red discharge from eyes and noses were observed. During the post-exposure period whooping or gasping respiration with rasping sounds during inspiration.

Body weight: After 7 days, the body weights of the treated males were clearly impaired compared to controls; After14 days this impairment still was observed in the 0.28 and the 0.39 mg/l groups. For the females, the body weight inthe 0.39 mg/l group was impaired during the whole observation period; the body weight of the 0.28 mg/l group only was affected after 7 days.

Gross pathology: Necropsy of the animals that died during the experiment revealed acute congestion, pronouncedemphysema of the lungs as well as edematization and infarctoid hyperemia.

Dermal Toxicity

Clinical signs: Two males and one female showed mucoid feces on day 1 to 2 of treatment; one female showed wetbrown urogenital staining about 4 hours after application. From day 3 of observation, no more signs of toxicity were seen, and all animals appeared normal.

Body weight: Body weights were inconspicuous over the complete period of observation.

Gross pathology: Necropsy revealed thickening and scabbing of the application sites in all animals. No furthertreatment-related abnormalities were reported.

Other findings:

Local skin changes: The treatment resulted in severe erythema, moderate to severe oedema and eschar with subsequent exfoliation in all animals. In 6 cases, the application sites displayed signs of corrosion. Fissuring of the skinwas seen in 9 cases after day 6, and on day 7, yellow staining and desquamation were seen in all animals. These severe signs of skin irritation persisted over the complete period of observation in all animals.

DELAYED/IMMEDIATE/CHRONIC EFFECTS FROM LONG/SHORT TERM EXPOSURE

Refer above to test results for 50% Glutaral solution.

NUMERICAL MEASURES OF TOXICITY (SUCH AS ATE)

TEST	ROUTE	SPECIES	VALUE	EFFECTS
LD50	Oral	Rat (OECD 401)	154 mg/kg bw	Refer above to test results for 50% Glutaral solution
4Hr LC50 (Dust/Mist)	Inhalation	Rat (OECD 403)	0.28 – 0.39 mg/l	
LD50	Dermal	Rabbit (OECD 402)	> 2 000 mg/kg bw	

INTERACTIVE EFFECTS

No additional data available.

WHERE SPECIFIC CHEMICAL DATA IS NOT AVAILABLE
No additional data available.

MIXTURES
No additional data available.

MIXTURES VS INGREDIENTS INFORMATION
No additional data available.

OTHER INFORMATION
No additional data available.

SECTION 12 — ECOLOGICAL INFORMATION
TOXICITY

Aquatic Toxicity (Calculation based on GHS additivity formula)		
TEST	**SPECIES**	**ATE VALUE**
72Hr EC50	Desmodesmus subspicatus (OECD 201) (literature)	1.2 mg/l
48Hr EC50	Daphnia (literature)	4.2 mg/l
96Hr LC50	Salmo gairdneri (literature)	1.6 mg/l
NOEC/21d	Daphnia (OECD 211) (literature)	10.0 mg/l
NOEC 72Hr	Desmodesmus subspicatus (OECD 201) (literature)	0.05 mg/l

Evaluation: Based on the available data the classification criteria for hazard classes aquatic acute (short term) toxicity is not fulfilled. Toxic to aquatic life with long lasting effects.

Toxicity on activated sludge organisms		
TEST	**SPECIES**	**VALUE**
0.5Hr EC25	Activated Sludge (OECD 209) (literature)	Ca. 30 mg/l

Evaluation: Depending on concentration, toxic effects on activated sludge organisms are possible.

PERSISTANCE AND DEGRADEBILITY

OECD Test Guideline 301 (A-F)
> 90 % (Activated Sludge) (OECD 301 A) (literature)

Evaluation: The component(s) is (are) rapidly degradable.

Behavior in sewage treatment plants: The component(s) is (are) biodegradable in activated sludge units.

BIOACCUMULATIVE POTENTIAL

PARTITION COEFFICIENT: N-OCTANOL/WATER	
LOG-K_{OW}	0.36 (n-octanol/water) (23°C, pH 7 EU method A.8) Dossier (REACh)

Evaluation: Not worth-mentioning accumulating in organisms.

MOBILITY IN SOIL
No additional data available.

OTHER ADVERSE EFFECTS
Results of PBT and vPvB assessment

- PBT: This mixture does not contain substances that meet the PBT-criteria of REACH, annex XIII.
- vPvB: This mixture does not contain substances that meet the vPvB-criteria of REACH, annex XIII.
- Any other adverse effects on the environment are not expected.

Additional information

- Chemical Oxygen Demand (COD-value): 1385 mg O_2/g product
- Biological oxygen demand (BOD_5-value): 235 mg O2/g product
- Metals and their compounds acc. to Directive 2006/11/EC: None

European Water Framework Directive 2000/60/EC (WFD) dated 23.10.2000

- The product does not contain any priority substances according WFD that require a water monitoring.

Absorbable organic halogen compounds (AOX - DIN EN ISO 9562)

- The product does not contain substances, which can influence the AOX of wastewater.

SECTION 13 — DISPOSAL CONSIDERATIONS

WASTE DISPOSAL RECOMMENDATION

Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.

Incinerate in suitable incineration plant, observing local authority regulations. Dispose of waste and container in accordance with local and/or national regulations. Hazardous waste shall not be mixed with other waste. Different types of hazardous waste shall not be mixed if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport, or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle/reuse. Remove for physico-chemical/biological treatment. Avoid discharge into drains or the environment.

ECOLOGY – WASTE MATERIAL

DO NOT release to the environment.

EMPTY CONTAINER

Packaging's and containers, even those that have been emptied, will retain product residue and vapours, handle empty containers as if they were full. Remove all possible traces of product and wash prior to disposal of packaging and containers. Dispose in compliance with Regulations – see above and Industry Best Practice. Avoid reuse of empty container for other storage purposes.

Recycling Information

Packaging Type	Description	UN Code	Portion & Material	Symbol
Jerrican	Plastics Non-Removable Head	UN3H1/Y	Body & Enclosure (HDPE)	02 PE-HD
Drums	Plastics Non-Removable Head	UN1H1/Y	Body & Enclosure (HDPE)	02 PE-HD
Composite IBC	Plastic Receptacle Steel Cage	UN31HA1/Y	Body & Enclosure (HDPE) Cage (Steel)	02 PE-HD 40 FE
Labels	Product Label and Pictograms	N/A	Polyethylene Terephthalate	01 PET

SECTION 14 — TRANSPORT INFORMATION

TRANSPORTATION CLASSIFICATION	ADR/RID	ADN(R)	IMDG	ICAO/IATA
UN NUMBER	2922			
PROPER SHIPPING NAME	CORROSIVE LIQUID, TOXIC, N.O.S.			
HAZARD CLASS(ES)	8A / 6.1 			

PACKING GROUP	II				
MARINE POLLUTANT	No				
EMERGENCY RESPONSE	**ERG 2020** 154	-	**EMS GUIDE** F-A; S-B	**ERG DRILL GUIDE** 8P - Corrosive, Toxic	
EXEMPT / QUANTITY LIMITATIONS KG	**Exempt / Factor**	**Passenger rail**	N/A	**Passenger aircraft**	**Cargo aircraft**
	50 **/** 20	5 L		5 L	60 L
P, B, L & O Provisions SANS 10231	L13, L28	N/A	N/A	N/A	
Vessel Stowage	N/A	N/A	**10A –** B **10B –** 40	N/A	
NEMA Reportable Quantity	Not Listed				

Vessel Stowage

Stowage category 10(A) “B” means:

i. The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger, vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 mof overall vessel length: and

ii. “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

10(B) “40” means:

Stow “clear of living quarters.

DO NOT load with Classes 1, 2.3 or 7. Cyanides must not be transported with acid.
May be loaded with Classes 2.1, 2.2, 5.2, 6.1, 6.2 and 8B if kept at least 1 meter apart.Concentrated acids and bases must be kept at least 1 meter apart.
Can be loaded with all other classes.
Goods of different classes must be segregated by an air space of at least 100mm or by an approved segregation device or non-dangerous goods.

P, B, L and O provisions as per SANS 10231:2006

L13 If any substance has leaked and spilt in a vehicle or container, the vehicle or container may not be re-used until after it has been thoroughly cleaned and, if necessary, disinfected or decontaminated. Any other goods and articles carried in the same vehicle or container shall be examined for possible contamination.

L28 Packages shall not be loaded together with packages known to contain foodstuffs, other articles of consumption or animal feeds

SECTION 15 — REGULATORY INFORMATION

SA NATIONAL LEGISLATION

Hazardous Substances Act 15 of 1973 and Regulations.
Occupational Health and Safety Act 85 of 1993 and Regulations.
National Environmental Management Act 107 of 1998 and Regulations.

SA NATIONAL STANDARDS

SANS 10228: 2006: Identification and Classification of Dangerous Goods for Transport by Road and Rail.
SANS 10231: 2018: Transport of Dangerous Goods - Operational Requirements for Road Vehicles.
SANS 10234: 2019: Globally Harmonized System of Classification and Labelling of Chemicals (GHS).
SANS 11014: 2010: Safety Data Sheets for Chemical Products.
SANS 10263-0: 2017: The Warehousing of Dangerous Goods. General Requirements
SANS 10263-5: 2015: The Warehousing of Dangerous Goods. The Storage and Handling of Oxidizing Substances
SANS 10263-8: 2012 The Warehousing of Dangerous Goods. The Storage and Handling of Corrosive Substances.

Chemical safety assessment
Not assessed.

SECTION 16 — OTHER INFORMATION

FULL TEXT OF H & P - STATEMENTS REFERRED TO UNDER SECTION 2

HAZARD STATEMENTS	PRECAUTIONARY STATEMENTS
H314: Causes severe skin burns and eye damage. H317: May cause an allergic skin reaction. H331: Toxic if inhaled. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335: May cause respiratory irritation. H400: Very toxic to aquatic life. H411: Toxic to aquatic life with long lasting effects.	P260: Do not breathe spray. P264: Wash exposed areas thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P272: Contaminated work clothing should not be allowed out of the workplace. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection. P284: [In case of inadequate ventilation] wear respiratory protection. P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P302+P352: IF ON SKIN: Wash with plenty of water and soap. P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER/doctor. P321: Specific treatment (see IF SWALLOWED, IF ON SKIN, IF INHALED, IF IN EYES on this label). P333+P313: If skin irritation or rash occurs: Get medical advice/attention. P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER/doctor. P362+P364: Take off contaminated clothing and wash it before reuse. P363: Wash contaminated clothing before reuse. P391: Collect spillage. P403+P233: Store in a well-ventilated place. Keep container tightly closed. P405: Store locked up. P501: Dispose of contents and container in accordance with local, regional, national, international regulations to licenced hazardous waste manager.

LABELLING SANS 10234:2008
SIGNAL WORD: DANGER

PICTOGRAMS

PHYSICAL & HEALTH HAZARD		ENVIRONMENTAL HAZARD		TRANSPORT	
GHS05 GHS06 GHS08	Corrosive Substance Toxic Substance Serious Health Hazard Substance	GHS09	Environmental Toxic Substance	Class 8.1 Class 6.1	Corrosive Acidic Toxic
					

LEGEND TO ABBREVIATIONS & ACRONYMS

ABEK: Organic gases and vapours (BP>65ºC); Inorganic gases and vapours; Sulphur dioxide and other acid gases and vapours; Ammonia and organic ammonia derivatives
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
BCF: Bioconcentration Factor
BOD5: Biological Oxygen Demand in 5
CAS: Chemical Abstracts Service
CBI: Confidential Business Information
CEN: European Committee for Standardization
COD: Chemical Oxygen Demand
DMEL: Derived Minimal Effect Level
DNEL: Derived No Effect Level
EC: European Commission
EC50: Half Maximal Effective Concentration
EMS: Emergency Medical Services
ERG: Emergency Response Guidelines
EU: European Union
GHS: Globally Harmonized System
IARC: International Agency for Research on Cancer
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
ICSC: International Chemical Safety Cards
IMDG: International Maritime Dangerous Goods
LC50: Lethal Concentration 50 (concentration in water having 50% chance of causing death to aquatic life)
LD50: Lethal Dose 50 (median concentration of a toxicant that will kill 50% of the test animals within a designated period)
LOG-KOW: Logarithm - Octanol - Water Partition Coefficient
NIOSH: National Institute for Occupational Safety and Health (US CDC)
NTP: National Toxicology Program
OEL: Occupational Exposure Limit
OSHA: Occupational Safety and Health Administration
P, B, L & O: Packaging, Bulk Transport, Loading Operation & Transport Operation
PBT: Persistent, Bio accumulative, and Toxic
PNEC: Predicted No-Effect Concentration
PPE: Personal Protection Equipment
RID: European Agreements Concerning the International Carriage of Dangerous Goods by Rail
RTECS: Registry of Toxic Effects of Chemical Substances
SANS: South African National Standard
STP: Standard Temperature and Pressure
vPvB: Very Persistent Very Bio Accumulative

KEY LITERATURE REFERENCES AND SOURCES

Source	Hyperlink
GESTIS DATABASE	GESTIS Substance Database
ECHA (European Chemicals Agency)	Glutaral 100.003.506 | Overview - ECHA CHEM
PUBCHEM DATA	Glutaral | C5H8O2 | CID 3485 - PubChem
ICSC	ICSC 0158 - GLUTARALDEHYDE
CAMEO CHEMICALS	GLUTARALDEHYDE SOLUTION | CAMEO Chemicals | NOAA
USCG CHRIS Code	GTA.pdf
RTK Hazardous Substance Fact Sheet	Microsoft Word - 0960.doc
NIOSH POCKET GUIDE	CDC - NIOSH Pocket Guide to Chemical Hazards - Glutaraldehyde
RTECS - NIOSH"	RTECS:MA2450000 - Glutaraldehyde - The Registry of Toxic Effects of Chemical Substances | CDC/NIOSH
USA EPA COMPTOX	Glutaraldehyde - Chemical Details

***Note**: CBI – Information available, on request, to the regulatory authority and emergency responders.*

COMPILED BY: CST Comp: R. van Rooyen.

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